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Installation and Maintenance Manual Van's 14 and 14A



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*This document contains **29** pages - Original in color*

D						
C						
B	23/10/2020	GAILLARD.C	MERLE.Y	GAYRAUD.F	Update of brake lines	Finish
A	05/07/2018	GAILLARD.C	BERINGER.G	BERINGER.C	Edition initiale RV14 only	Finish
	Date	Name - Visa Redaction	Name – Visa Verification	Name – Visa Approbation	Modifications	Status

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Installation and maintenance manual

**Ref document:
 BRG-MM-002.14(B)**

MODIFICATION LIST

REV	Modifications
A	Edition initiale
B	Update of brake lines

Référence documents

Title	Assembly reference	Rev
RV14 Tail Dragger 5.00x5" HL_Main Wheel Assy	AV-VANS-220	A
RV14 Tricycle 5.00x5" HL_Main Wheel Assy	AV-VANS-221	A
RV14 _Hose 00 Main Wheel	AV-VANS-210.0	A
RV14A _Hose 01 Main Wheel	AV-VANS-210.1	A
RV14 & RV14A _Hose 02 Fuselage/FP	AV-VANS-210.2	A
RV14 & RV14A _Hose 03 FP/Regulator	AV-VANS-210.3	A
RV14 & RV14A _Hose 04 Regulator/MC Pilot	AV-VANS-210.4	A
RV14 & RV14A _Hose 05 MC Pilot/MC Copilot	AV-VANS-210.5	A
RV14 & RV14A _Hose 06 MC Copilot-Reservoir	AV-VANS-210.6	A
RV14 & RV14A _Hose 07 MC pilot-FP	AV-VANS-210.7	A
RV14 & RV14A _Hose 08 Fuselage-MC Pilot	AV-VANS-210.8	A
VANS_Master Cylinder	AV-VANS-060	A
VANS_Reservoir	AV-VANS-070	A
VANS_Parking brake valve	AV-VANS-080	A
RV14 & RV14A _Regulator Assy	AV-VANS-290	A
RV10,14 Tricycle 5.00x5" HL_Nose Wheel Assy	AV-VANS-530	A

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1. General

This manual gives the installation procedures of BERINGER wheel and brake system on the Van's RV14 and 14A .

CAUTION: Substitution of parts by other than originally certified parts may cause failure of brake system. BERINGER quality process assures that replacement parts are produced and controlled with the same quality level as originally certified.

BERINGER brake system functioning is similar to original brake system.

CAUTION: Standard MIL-H-5606 Brake fluid is replaced by fire resistant fluid:
MIL-PRF-87257 and MIL-PRF83282, make sure that only those brake fluids are used.

Note: after each part number the (-) indicates the minor revision status starting from letter A then B, C,

2. Tightening Torque

Description	Tightening Torque					
	Min		Nominal		Max	
	IN-LBS	N/m	IN-LBS	N/m	IN-LBS	N/m
NAS6604	90	10.2	95	10.8	100	11.3
AN6-65 AN6	386	43.7	407	46	427	48
HYD-003P	140	16.1	148	17	155	17.8
ECR-002	148.	15.2	141	16	148	16.8

3. Nose wheel Kit

3.1. RV 14 Tail Dragger landing Gear

None

3.1.1. RV14A Tricycle landing Gear (SRVFI01)

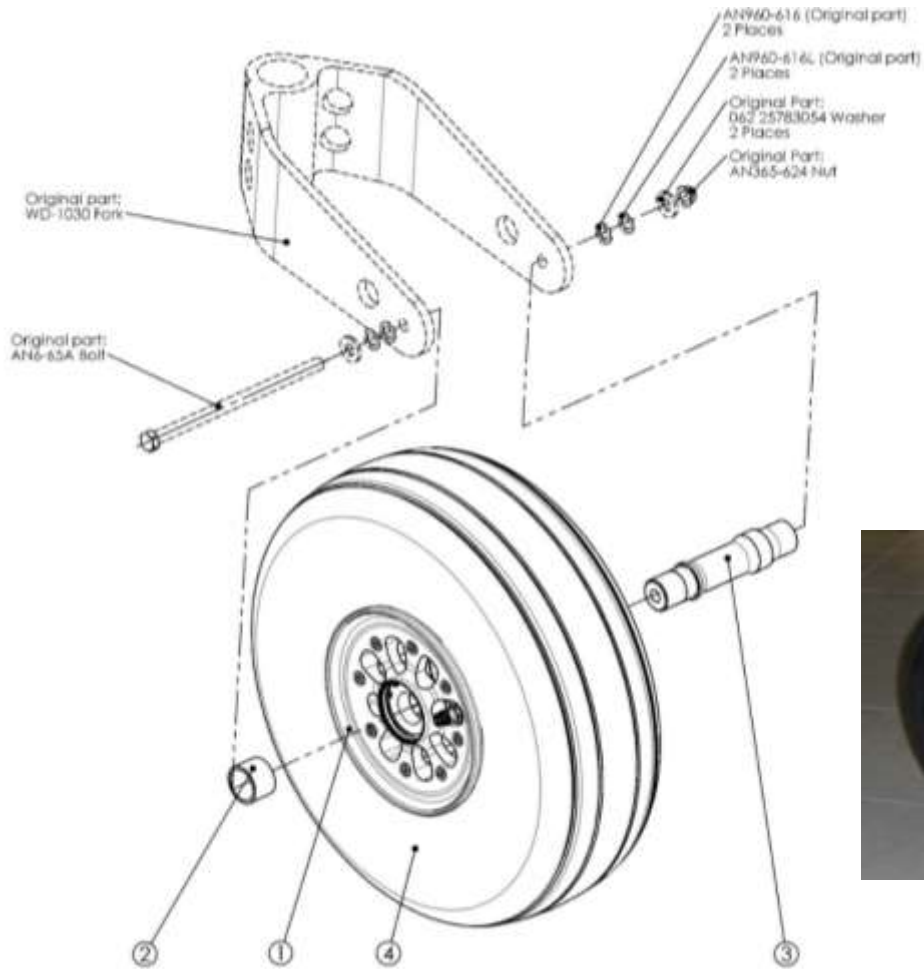


Figure 1 Nose Wheel Assy (AV-VANS-210)

4	PAA02	Tire 5.00x5"	1
3	AV-VANS-010(A)	Axle	1
2	AV-VANS-004(A)	Bearing spacer	1
1	RA-014(A)	Wheel Assy.	1
REP	PART NUMBER	DESCRIPTION	QTY.

4. Finishing Kit for main wheels

4.1. RV 14 Tail Dragger landing Gear

4.1.1. Main Wheel Assembly RV 14 Tail Dragger landing Gear

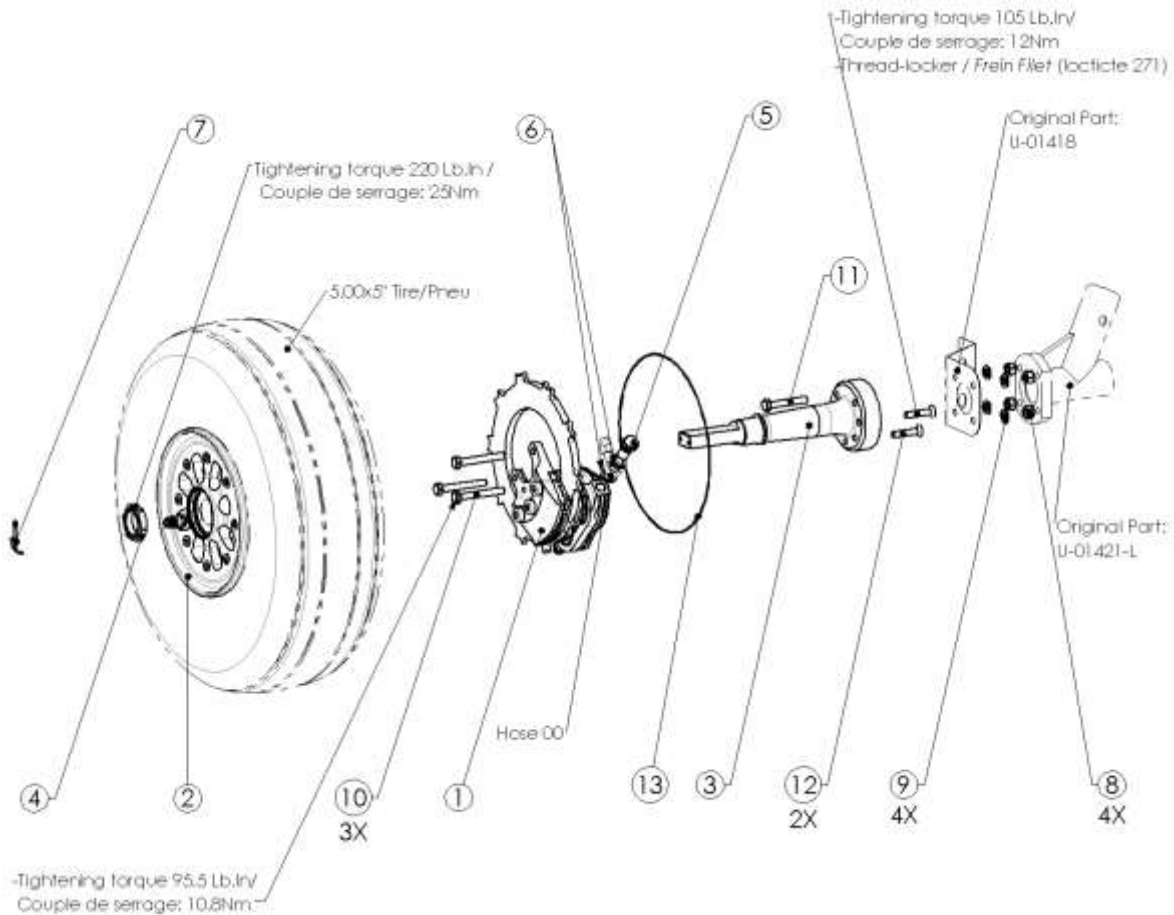
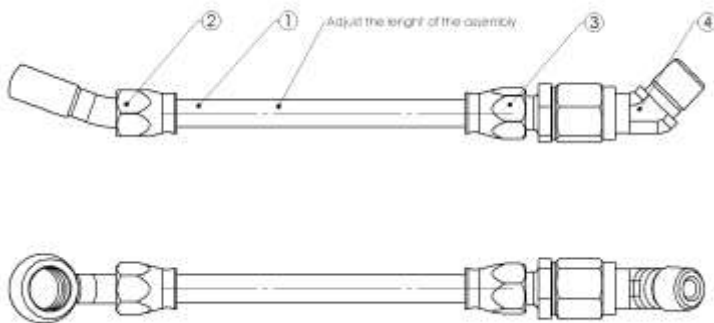


Figure 2 RV14 Tail Dragger 5.00x5" HL Main Wheel Assy (AV-VANS-220)

13	ZPA02	Safety Wire/Fil a freiner	1
12	V-FHC-007	M6x30 (Q10.9)_Screw/Vis	2
11	NAS6604-20	1/4-28 L=42.54_Screw/Vis	1
10	NAS6604-25	1/4-28 L=50.48_Screw/Vis	3
9	NAS1149F0463P	1/4 Ep=1.6_Washer/Rondelle épaisse	4
8	MS21044N-4	1/4-28_self-locking Nut/Ecrou NL	4
7	L-V-004	2.5x36_Cotter Pin/Goupille fendue	1
6	HYD-005B	Copper Seal/ Joint cuivre	2
5	HYD-003P	M 10x1_Banjo Bolt/ Vis Banjo	1
4	ECR-002(B)	M 25x1.5_Axle nut/Ecrou	1
3	AV-VANS-200(A)	Vans RV 14 5.00x5" HL_Axle / Fusée	1
2	RF-018(A)	5.00x5" HL_Main Wheel Assy/ Roue freinée	1
1	EA-002.2N(A)	2P32-5-7.2_Brake Caliper/ Etrier de frein	1
REP	PART NUMBER	DESCRIPTION	QTY.

4.1.2. Hose Main wheel Assy Right and Left (Drawing reference: AV-VANS-210.0 Hose 00)



4	HYD-045D	(3/8x24 ;1/8x27 NPT)_90°Elbow	1
3	HYD-008OP	female fitting 3/8x24	1
2	HYD-002OP	Steel fitting 20°/Banjo 20° Acier	1
1	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
REP	PART NUMBER	DESCRIPTION	QTY.

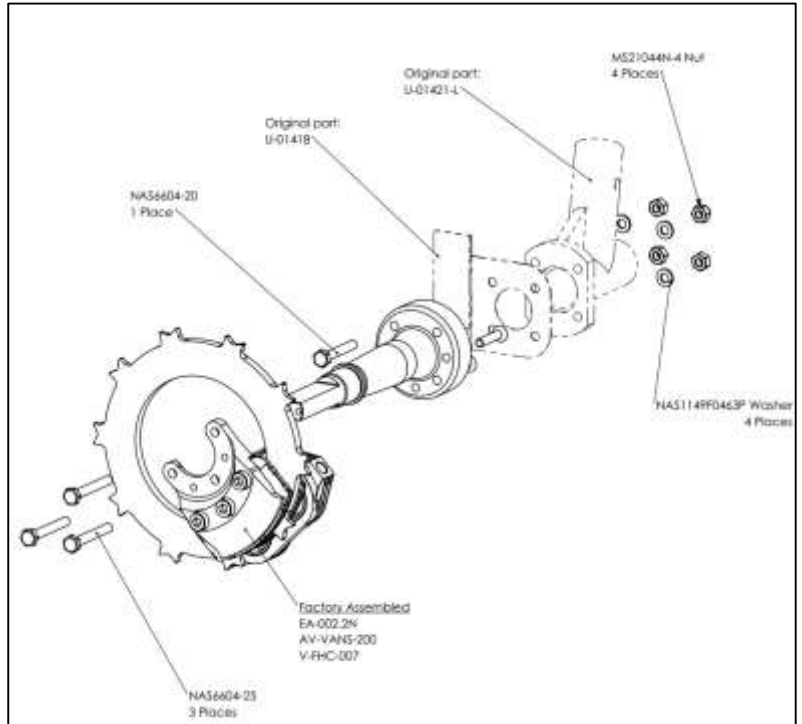
4.1.3. Installation Main wheel Assy Left (The right is the same just symmetrical)

- Place the axle and the brake assembly in position on the gear leg; do not forget U-01418.
- Apply a thin coat of corrosion inhibitive sealant type CA1000 from PRC De Soto (or equivalent) on next contact surfaces:
 - between axle /U-01418
 - on axle bolts
- Install the 4 bolts, the Axle washer and the 4 self locking nuts.

NOTE: Bolt head must be on wheel side.

NOTE: There are 3 bolts size NAS6604-25 and 1 shorter bolt size NAS6604-20

- Torque the nuts to appropriate torque – refer §2.



- Apply a thin coat of grease on wheel bearings.

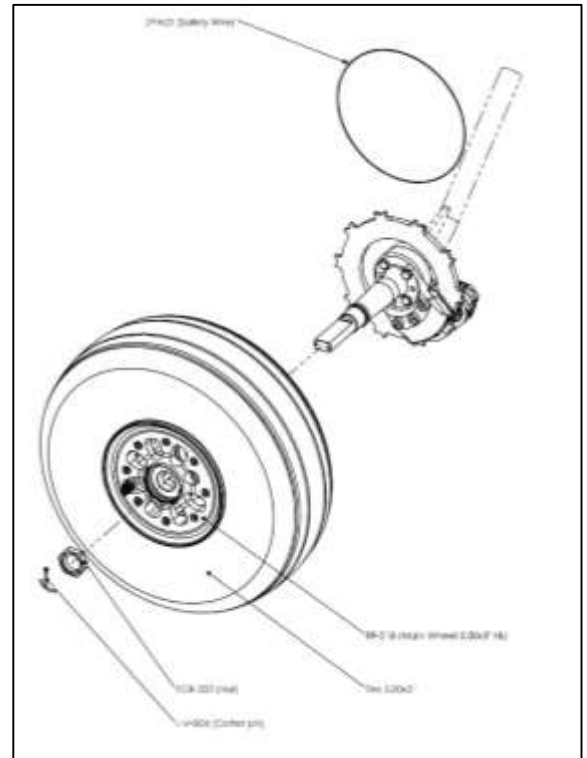
- f) Insert the wheel through the axle while placing the disc in wheel slots.

NOTE: Do not force, the disc has to be properly positioned to fit inside wheel slots

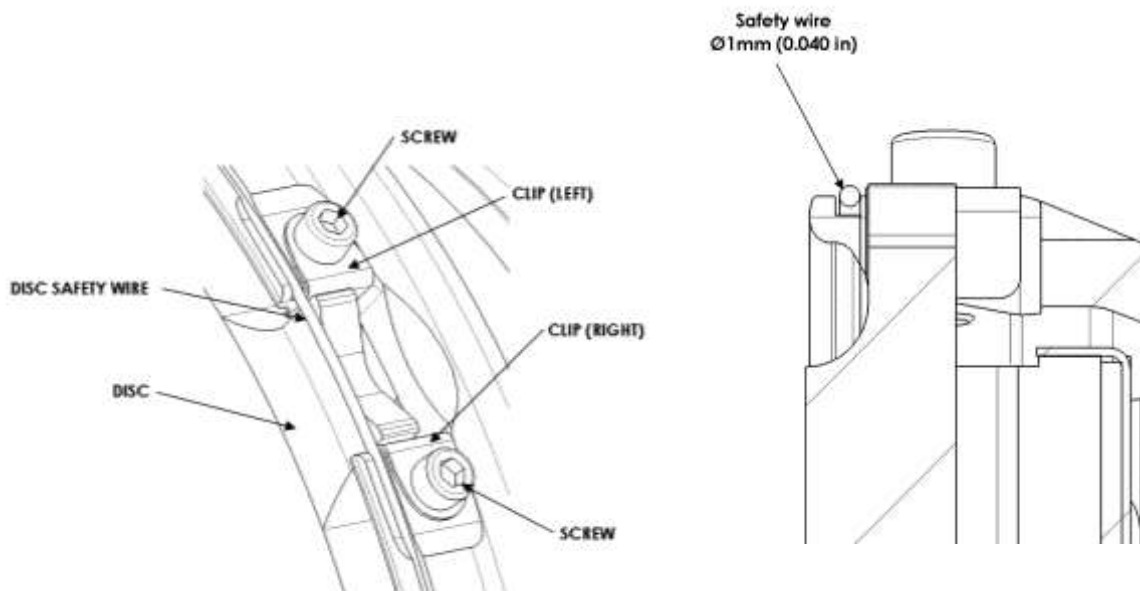
- g) Apply a thin coat of grease on axle thread. Screw the axle nut to contact
- h) Torque axle nut §2
- i) Insert cotter pin to secure the axle nut

CAUTION: Cotter pin must be in place to prevent the loose of axle nut.

- j) Place a safety wire (stainless steel 1mm – 0.040”) in the ring groove all around the wheel. This safety wire must be in place to secure the disc.



CAUTION: This safety wire must be in place to secure the disc.



Brake lines are made from Teflon and stainless steel hose braided.

CAUTION: Brake lines and hydraulic schema are different from original. Make sure that new brake lines are connected properly. The brake system will not work if brake lines are not connected properly.

4.1.4. Installation Hose Main Wheel

- a) Assembly following §4.1.2 (Caution length of the Stainless steel brake hose must be adjusted)
- b) On the brake caliper : install Hose Main Wheel
- c) Torque the banjo bolt see §2

NOTE: If under torque is applied there may be a leakage, if over torque is applied the banjo bolt may broke or damage the internal thread

CAUTION: Copper seals cannot be re-used after being locked because they may leak. They must be changed each time the fitting is removed.

4.2. RV 14A Tricycle Landing Gear

4.2.1. Main Wheel Assembly

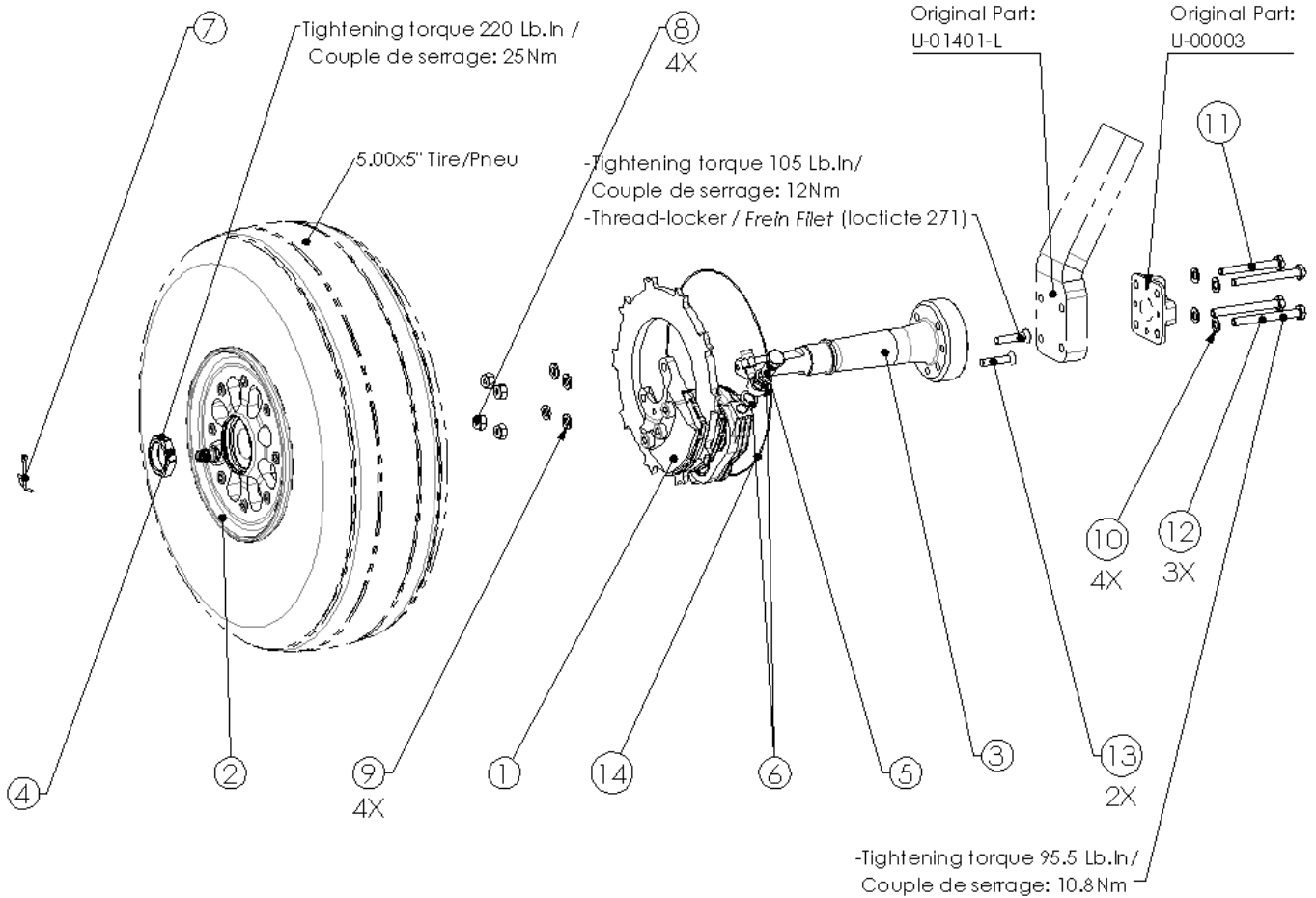
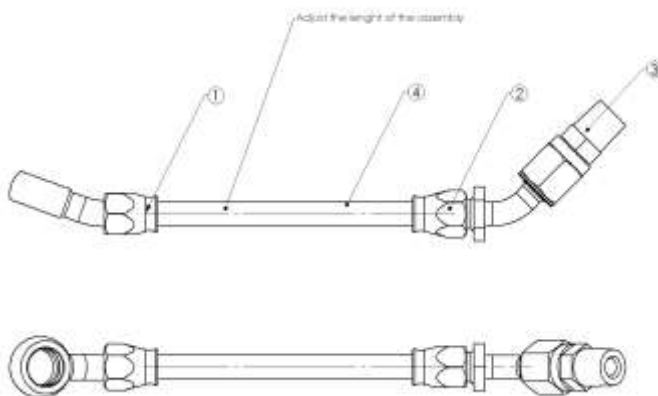


Figure 3 RV14 Tricycle 5.00x5" HL_Main Wheel Assy (AV-VANS-220)

14	ZPA02	Safety Wire/Fil a freiner	1
13	V-FHC-007	M6x30 (Q10.9)_Screw/Vis	2
12	NAS6604-33	1/4-28 L=63.18_Screw/Vis	3
11	NAS6604-28	1/4-28 L=55.24_Screw/Vis	1
10	NAS1149F0432P	Washer AN4 / Rondelle AN4 Std	4
9	NAS1149F0463P	1/4 Ep=1.6_Washer/Rondelle épaisse	4
8	MS21044N-4	1/4-28_self-locking Nut/Ecrou NL	4
7	L-V-004	2.5x36_Cotter Pin/Goupille fendue	1
6	HYD-005B	Copper Seal/ Joint cuivre	2
5	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	1
4	ECR-002(B)	M25x1.5_Axle nut/Ecrou	1
3	AV-VANS-200(A)	Vans RV14 5.00x5" HL_Axle / Fusée	1
2	RF-018(A)	5.00x5" HL_Main Wheel Assy/ Roue freinée	1
1	EA-002.2N(A)	2P32-5-7.2_Brake Caliper/ Etrier de frein	1
REP	PART NUMBER	DESCRIPTION	QTY.



4.2.2. Hose Main wheel Assy Right and Left (Drawing reference: AV-VANS-210.1 Hose 1)



4	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
3	HYD-024D	Adaptator 3/8x24-1/8NPT	1
2	HYD-0210P	3/8x24_45° Fitting Female	1
1	HYD-0020P	Steel fitting 20°/Banjo 20° Acier	1
REP	PART NUMBER	DESCRIPTION	QTY.

4.2.3. Installation Main wheel Assy Left (The right is the same just symmetrical)

- Place the axle and the brake assembly in position on the gear leg; do not forget U-00003
- Apply a thin coat of corrosion inhibitive sealant type CA1000 from PRC De Soto (or equivalent) on next contact surfaces:
 - between axle /Gear leg
 - on axle bolts
- Install the 4 bolts, the Axle washer and the 4 self locking nuts.

NOTE: Bolt head must be on wheel side.

NOTE: There are 3 bolts size NAS6604-33 and 1 shorter bolt size NAS6604-28

- Torque the nuts to appropriate torque – refer §2.

- Apply a thin coat of grease on wheel bearings.

- Insert the wheel through the axle while placing the disc in wheel slots.

NOTE: Do not force, the disc has to be properly positioned to fit inside wheel slots

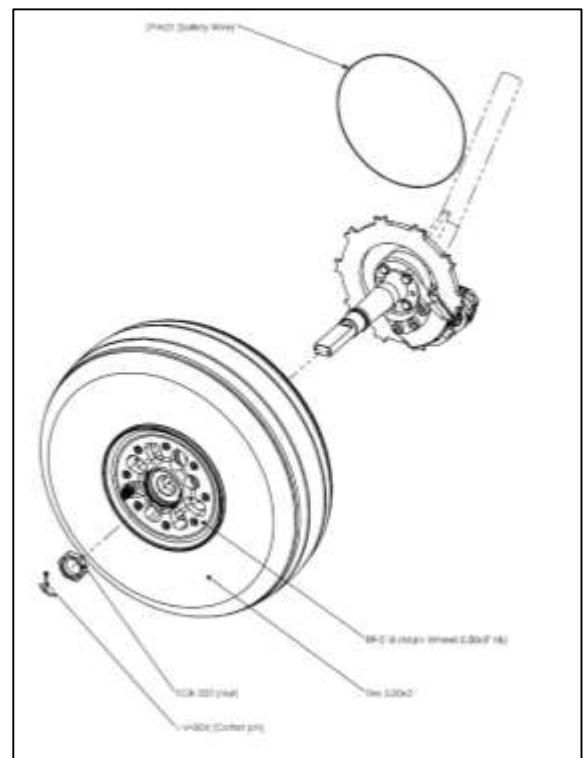
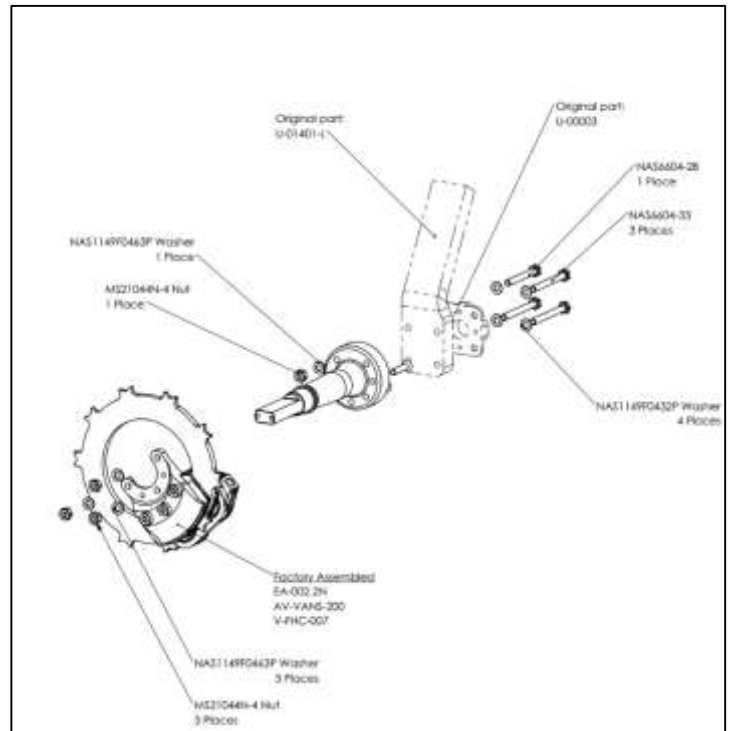
- Apply a thin coat of grease on axle thread. Screw the axle nut to contact

- Torque axle nut §2

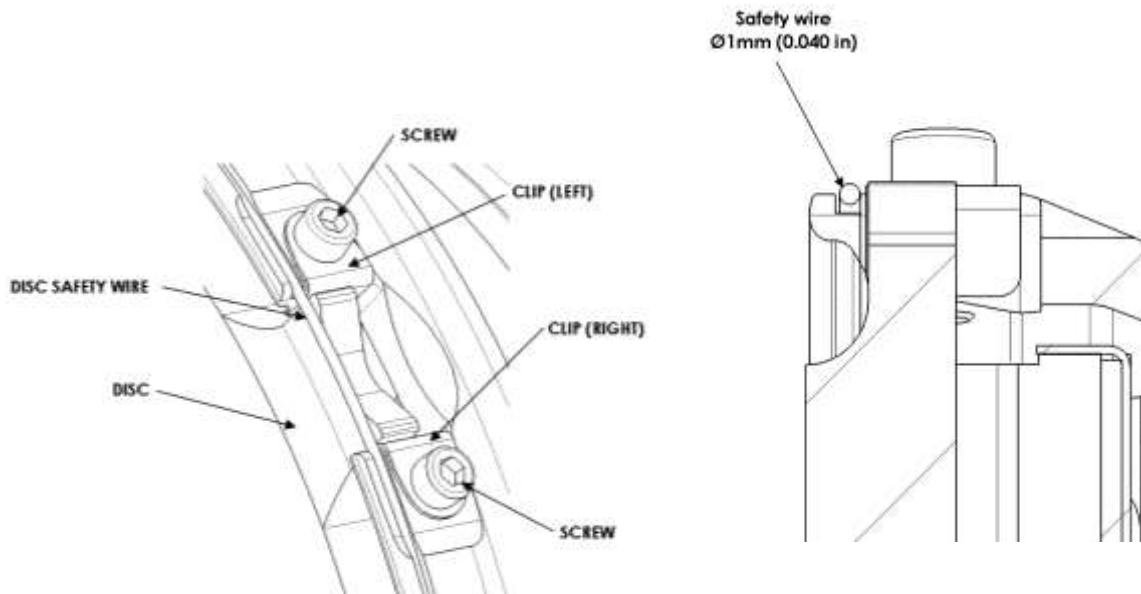
- Insert cotter pin to secure the axle nut

CAUTION: Cotter pin must be in place to prevent the loose of axle nut.

- Place a safety wire (stainless steel 1mm – 0.040") in the ring groove all around the wheel. This safety wire must be in place to secure the disc.



CAUTION: This safety wire must be in place to secure the disc.



Brake lines are made from Teflon and stainless steel hose braided.

CAUTION: Brake lines and hydraulic schema are different from original. Make sure that new brake lines are connected properly. The brake system will not work if brake lines are not connected properly.

4.2.4. Installation Hose Main Wheel

- a) Assembly following §4.1.2 (Caution length of the Stainless steel brake hose must be adjusted)
- b) On the brake caliper : install Hose Main Wheel
- c) Torque the banjo bolt see §2

NOTE: If under torque is applied there may be a leakage, if over torque is applied the banjo bolt may broke or damage the internal thread

CAUTION: Copper seals cannot be re-used after being locked because they may leak. They must be changed each time the fitting is removed.

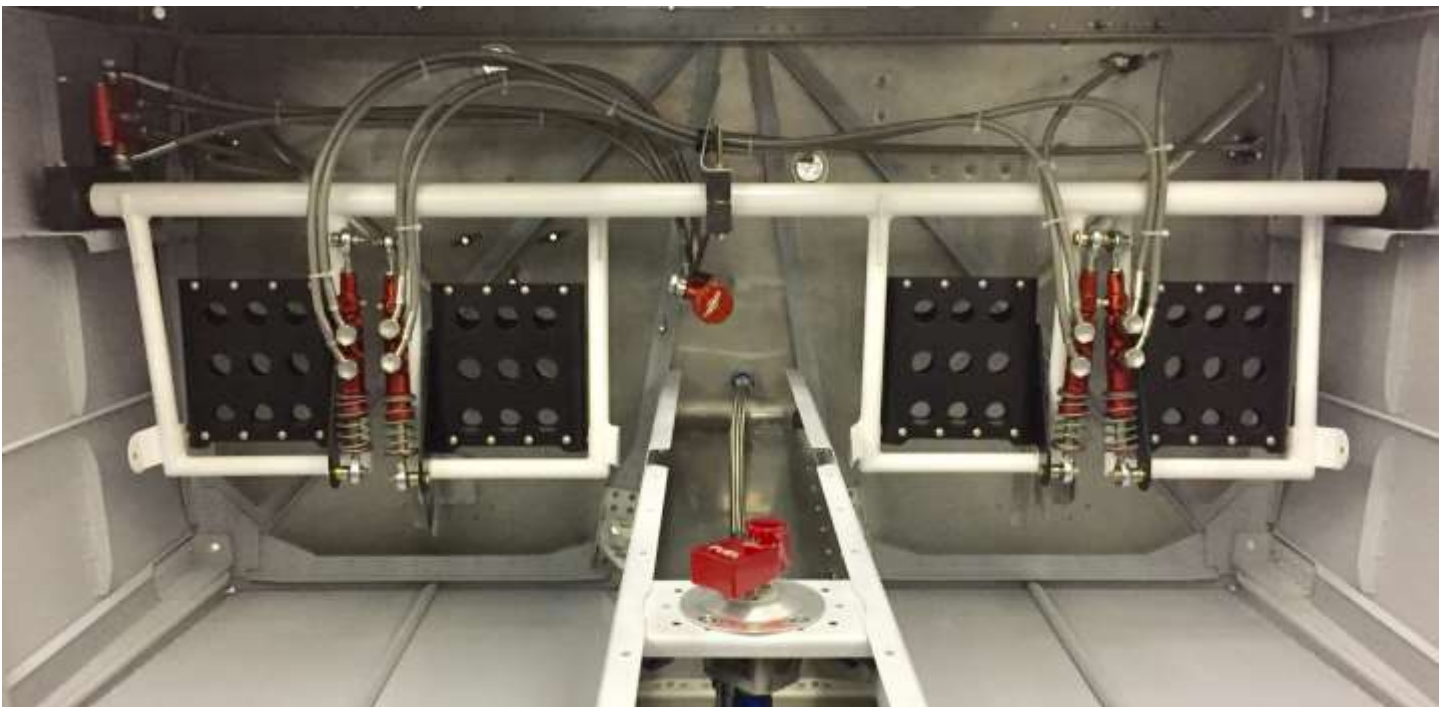


5. Fuselage Kit

5.1. Fuselage Kit RV14.

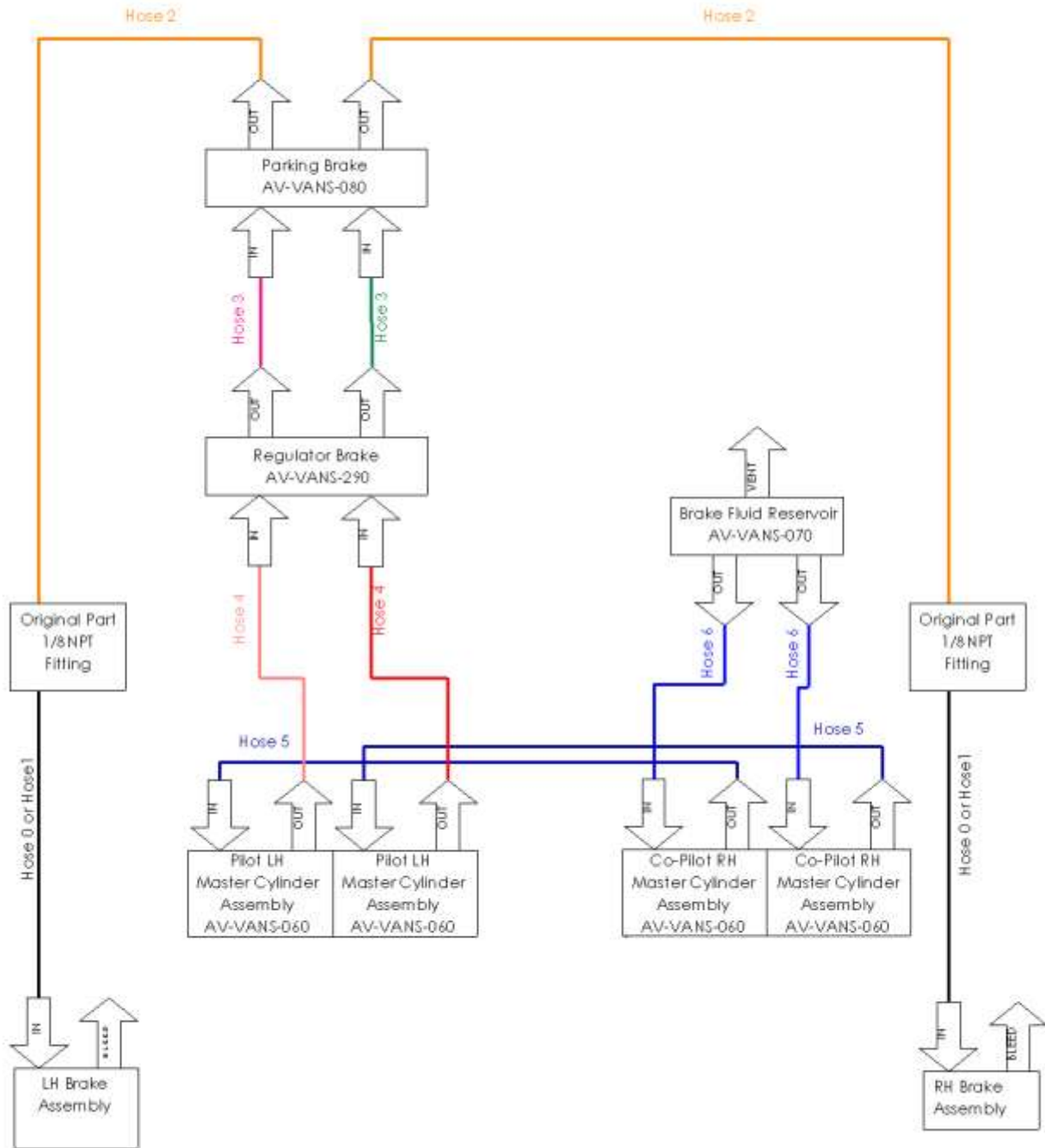
In the fuselage Kit, BERINGER offers 3 optional.

- Basic Kit + Copilote Master cylinder.
- Basic Kit + Copilote Master cylinder + Parking brake valve.
- Basic Kit + Copilote Master cylinder + Parking brake valve + Regulator Kit.

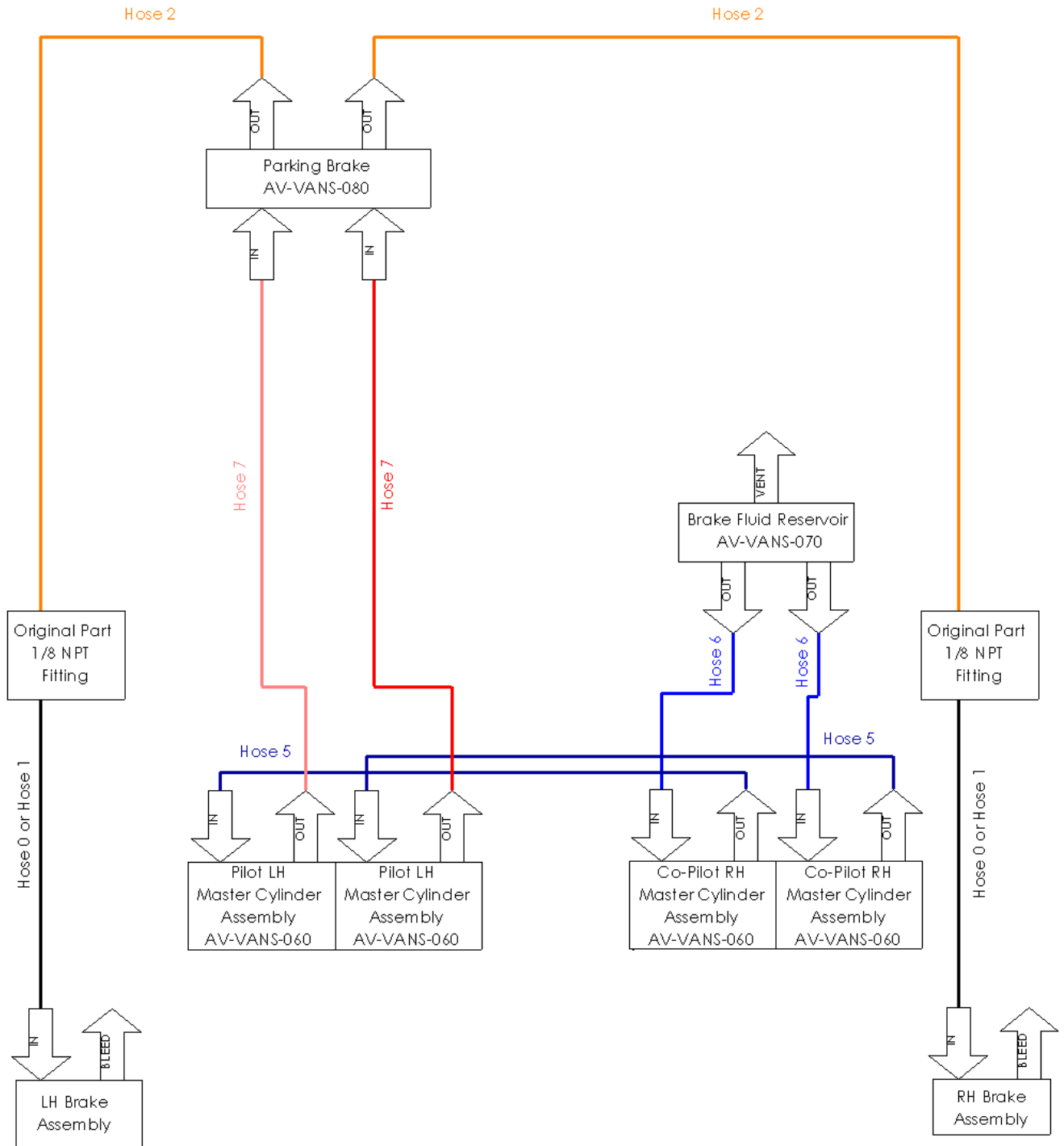


5.1.1. Full Hydraulic digram (Drawing reference)

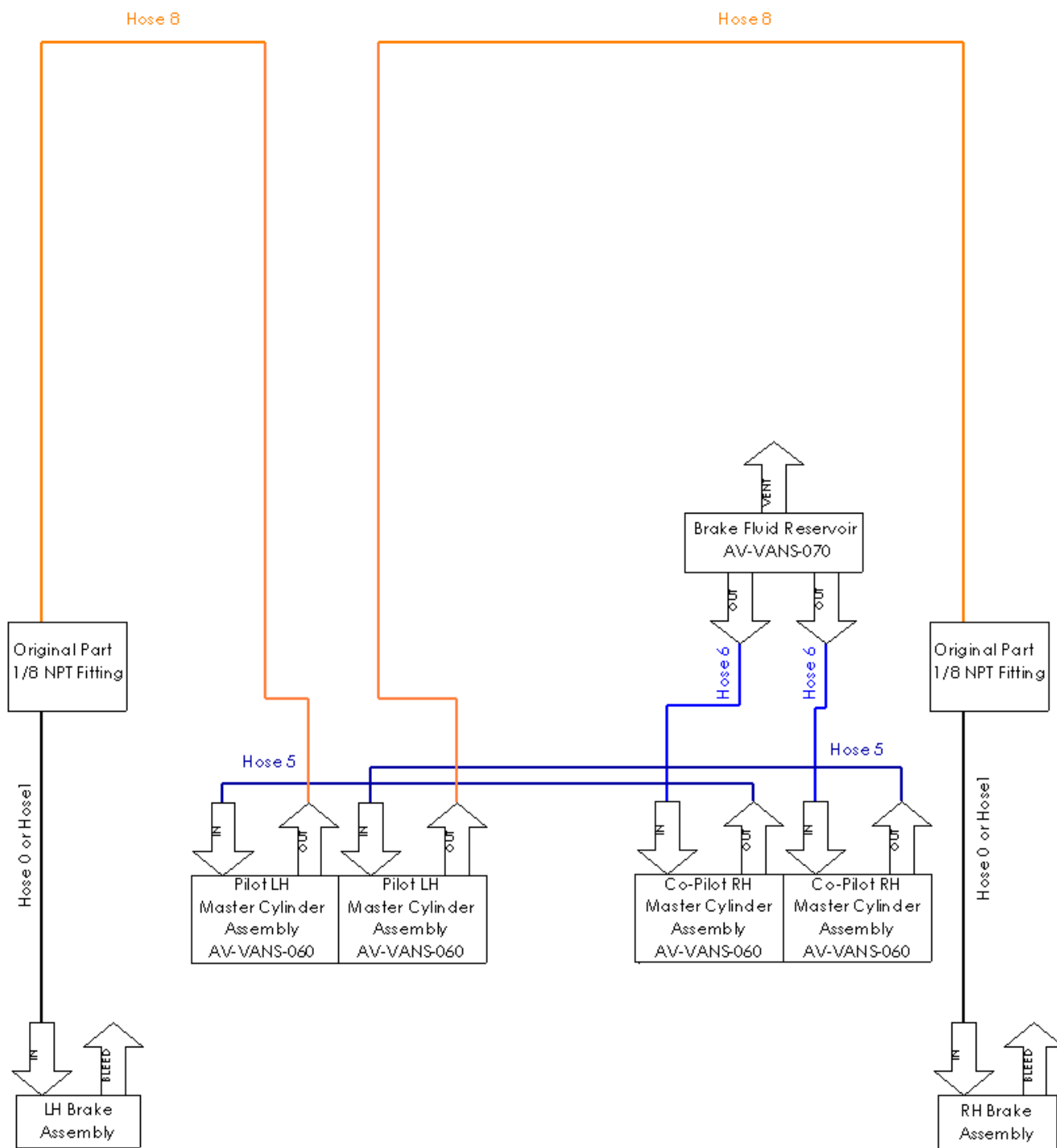
5.1.1.1 Basic+parking+copilot+regulator Kit).



5.1.1.2 Basic+parking+copilot Kit



5.1.1.3 Basic+copilot



5.1.2. Brake line

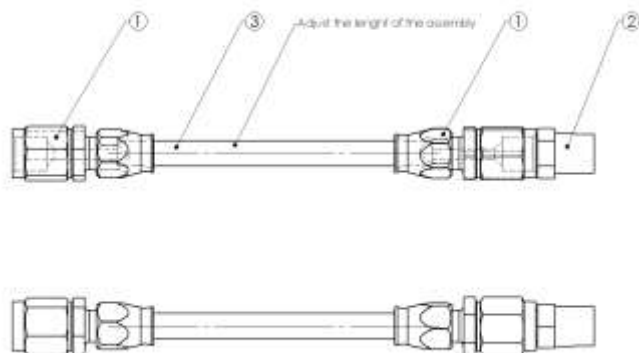
5.1.2.1 Hose 00 (Main wheel / Fuselage)(AV-VANS-210.0)

- See §4.1.1

5.1.2.2 Hose 01 (Main wheel / Fuselage)(AV-VANS-210.1)

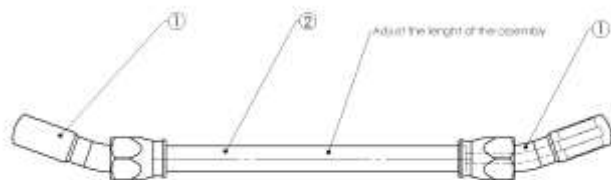
- See § 4.2.2

5.1.2.3 Hose 02 (Fuselage/FP) (AV-VANS-210.2)



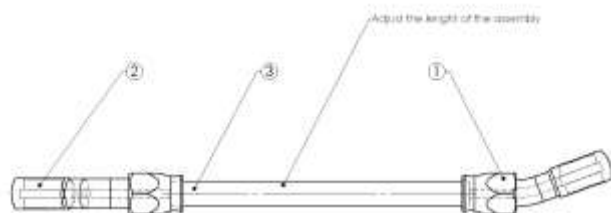
3	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
2	HYD-024D	Adaptator 3/8x24-1/8NPT	1
1	HYD-008OP	female fitting 3/8x24	2
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.4 Hose 03 (FP/Regulator) (AV-VANS-210.3)



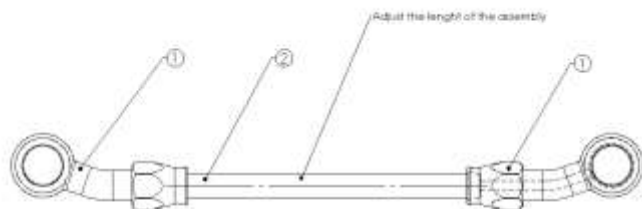
2	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
1	HYD-002OP	Steel fitting 20°/Banjo 20° Acier	2
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.5 Hose 04 (Regulator/MC Pilot) (AV-VANS-210.4)



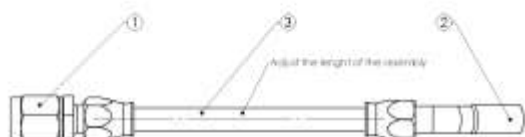
3	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
2	HYD-022OP	Banjo 20° lateral	1
1	HYD-002OP	Steel fitting 20°/Banjo 20° Acier	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.6 Hose 05 (MC Pilot/MC Copilot) (AV-VANS-210.5)



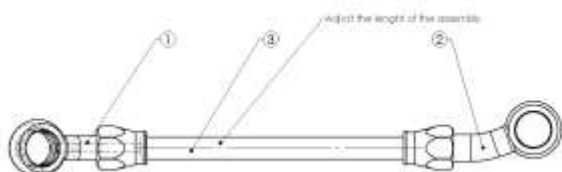
2	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
1	HYD-022OP	Banjo 20°lateral	2
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.7 Hose 06 (MC Copilot-Reservoir) (AV-VANS-210.6)



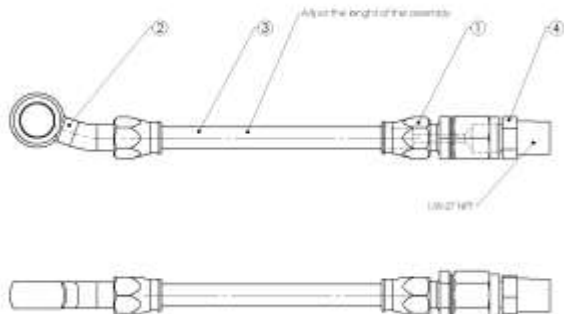
3	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
2	HYD-022OP	Banjo 20°lateral	1
1	HYD-008OP	female fitting 3/8x24	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.8 Hose 07 (MC pilot-FP) (AV-VANS-210.7)



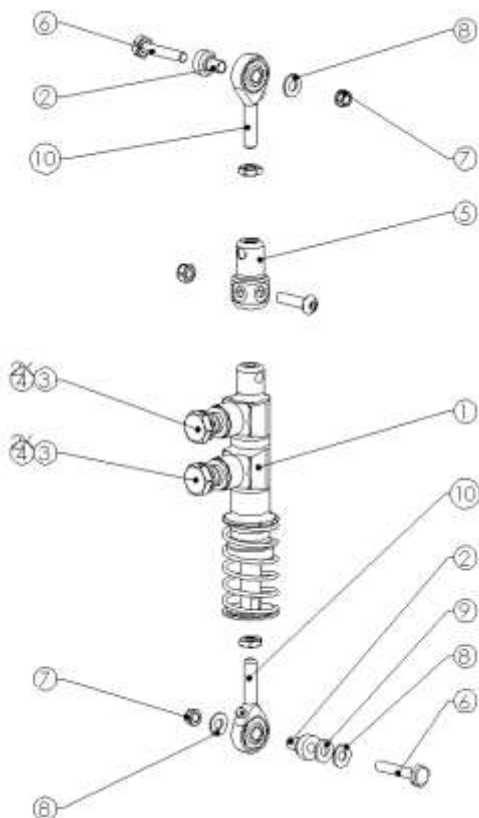
3	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
2	HYD-022OP	Banjo 20°lateral	1
1	HYD-002OP	Steel fitting 20°/Banjo 20°Acier	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.9 Hose 08 (Fuselage -MC pilot) (AV-VANS-210.8)



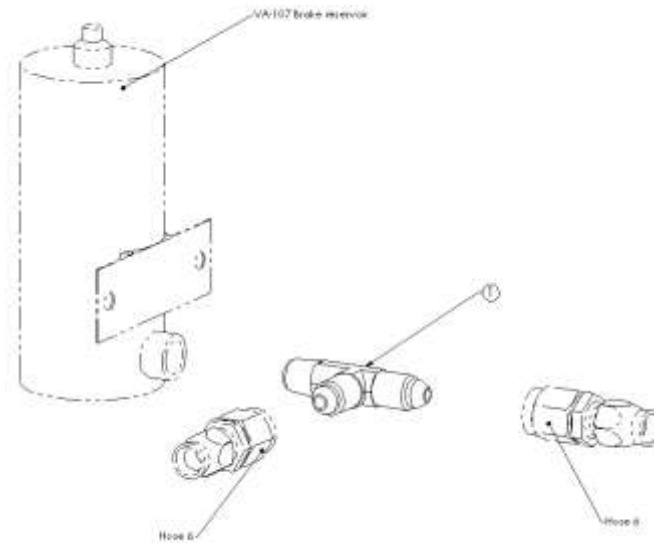
4	HYD-024D	Adaptator 3/8x24- 1/8NPT	1
3	HYD-032	Stainless steel brake hose/Durite tressée non gainée	1
2	HYD-022OP	Banjo 20°lateral	1
1	HYD-008OP	female fitting 3/8x24	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.3. Assembly Master cylinder right and left (Drawing reference AV-VANS-060)



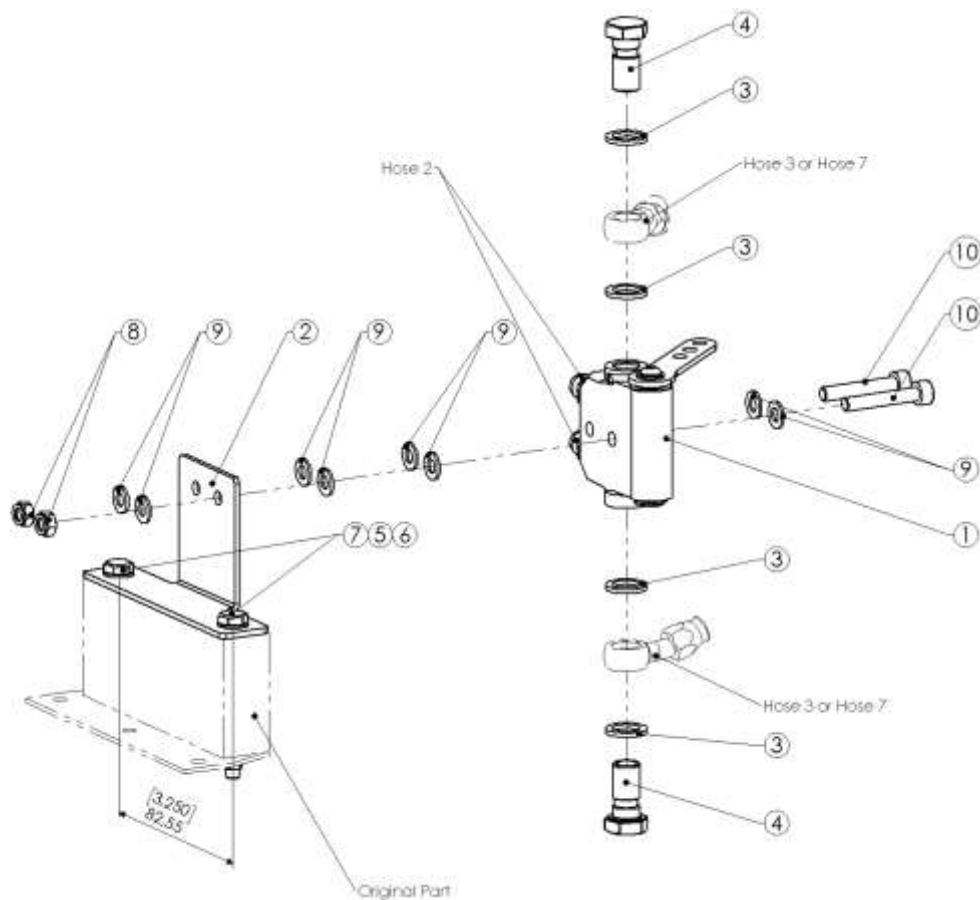
10	ZM-001	M6_Rod End / Rotule	2
9	NAS1149F0363P	AN3_Washer / Rondelle Epaisse	1
8	NAS1149F0332P	AN3 Std_Washer/Rondelle	3
7	MS21042-3	AN3_Self locking Nut/Ecrou NL	2
6	AN3-10A	AN3 (Ø4.76 L=26.19)_Screw / Vis	2
5	PGT-002(A)	MC12.2_Extender/Prolongateur	1
4	HYD-005B	Copper Seal/ Joint cuivre	4
3	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	2
2	BGE-011(A)	Ø5-6_Ball end Spacer / Entretoise Rotule	2
1	MP-002N(A)	Master Cylinder 12.2 5.5" NBR	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.4. Assembly Brake reservoir (Drawing reference AV-VANS-070)



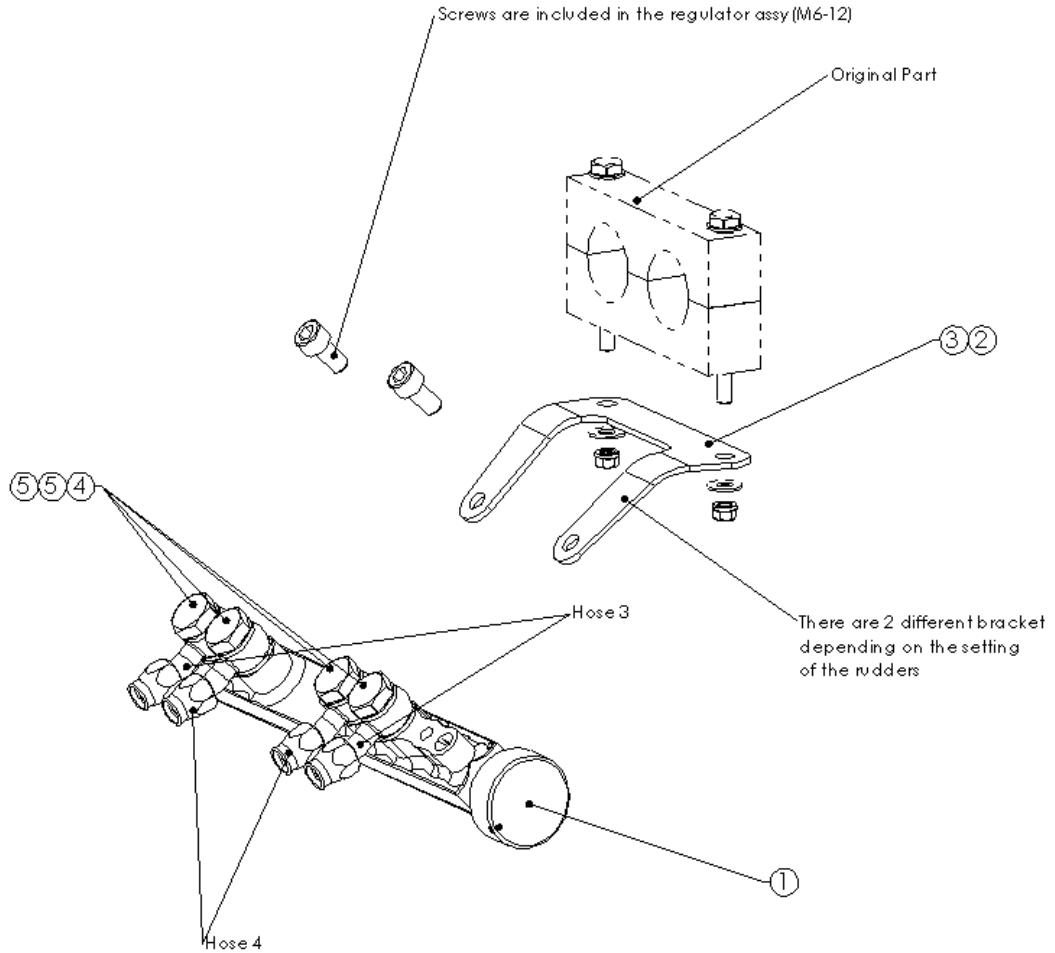
1	HYD-076D	AN826-03_JIC to NPT Male to Male Adaptors (3/8x24 1/8x27 NPT)	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.5. Assembly Parking brake valve(Drawing reference AV-VANS-080)



10	V-CHC-041	M5-30(Q12.9)_Screw/Vis	2
9	R-AP-004	Washer/Rondelle Z5	8
8	E-HN-002	M5_self-locking Nut/Ecrou	2
7	AN3-22A	AN4 L=57.94_Screw/Vis	2
6	MS21042-3	AN3_Self locking Nut/Ecrou NL	2
5	NAS1149F0332P	AN3 Std_Washer/Rondelle	4
4	HYD-003P	M 10x1_Banjo Bolt/ Vis Banjo	2
3	HYD-005B	Copper Seal/ Joint cuivre	4
2	AV-VANS-015(A)	VANS FP_Support	1
1	FP-001(A)	Minéral (3/8)_Parking Brake Valve/ Frein De Parking	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.6. Assembly Regulator (Drawing reference AV-VANS-290)



5	HYD-005B	Copper Seal/ Joint cuivre	8
4	HYD-003P	M 10x1_Banjo Bolt/ Vis Banjo	4
3	AV-VANS-006.1(A)	VANS Regulator_Elbow/Equerre	1
2	AV-VANS-006 (A)	VANS Regulator_Elbow/Equerre	1
1	RE-001N(B)	20-50 Bars_Regulator Assy/ Assemblage Regulateur	1
REP	PART NUMBER	DESCRIPTION	QTY.

6. Brake line

See on YOUTUBE:

- BERINGER tech Tip #2

A. Banjo Assembly



B. Cut the hose



- Using a fine tooth saw blade or cutter plier, cut hose to the required length.
- Clean any loose debris from both the cut ends and inside the hose.
- Then use a flat pliers to make the hole circular, as shown on the picture below.



C. Put the nut in the hose



Flare out stainless steel from PTFE tube (5mm length min.)

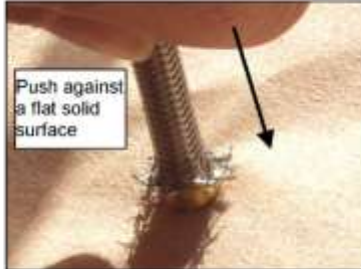
Use a fine screwdriver



D. Put the olive



Push the olive onto the end of PTFE inner tube and under the stainless steel braid. Make sure that all stainless steel filaments are outside of the olive.



Push against a flat solid surface

PTFE tube must be in contact with the olive



Make sure that PTFE tube is fully homed in the olive.

E. Put the banjo



Put lubricant

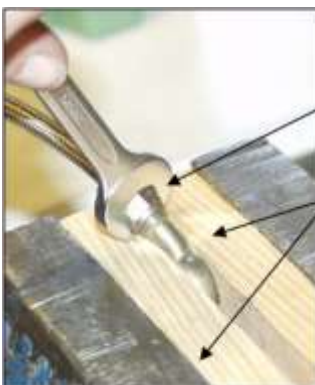
Push between hands the main fitting body and hose as shown on left picture.

Turn with hand the main fitting body to start threading the socket as shown on picture below.



Lubrificant: Drop off oil or WD40 on the thread

F. Tightening torque the socket



Torque tightening the socket at 10N.m to 15N.m (90 IN-LBS to 132 IN-LBS)

Maintain with wood plates to preserve the main fitting body

7. Maintenance

7.1. Equipment concerned

- Nose wheel for RV14A:

- P/N: RA-014

- Main wheel:

- P/N: RF-018

- Brake assembly:

- P/N: EA-002.2N

Notes :

- L and R indicates the Left and Right brake assemblies

7.2. Maintenance Manual Equipment concerned

For RA-014,RF-018 and EA-002.2N see Last revision of MM-ETSO-007 (available on demand by email)

For tire Assembly see on YOUTUBE:

- BERINGER tech Tip #1